



CIVIL QUALITY CONSULTANTS & ENGINEERS

ISO 9001:2015 Certified & NABL Accredited
Laboratory as per ISO/IEC - 17025-2017

Testing of Construction Material - Mechanical, Soil,
Bitumen, Non Destructive Testing Services, Project
Management Consultants, Third Party Quality Assurance, DPR.

Job No.:

CQCE/BBMP/MSV/W.No.14/2021-22

Date 28.07.2021

ATTERBERG LIMITS TEST FOR WMM

Client

: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.

Agency

: M/s. MSV Construction Company, Bangalore.

Name of Work

: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.

IS Code:

IS 2720(Part 5):1985

Date of Testing

26.07.2021 to 28.07.2021

Material Type

: Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	20.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

Note:

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For CIVIL QUALITY CONSULTANTS & ENGINEERS
Authorised Signatory

Corporate Off.: No. 133, Bhuvaneshwarinagar, Doddabasti Main Road, Bangalore-560 056.
Contact: 8553518550, 080-23240644 Email: civilqualityconsultants@gmail.com



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IS Code: IS 2720(Part 5):1985
Date of Testing 26.07.2021 to 28.07.2021
Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition CI.406.2.1.2
1	Liquid Limit	18.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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IS Code: IS 2720(Part 5):1985

Date of Testing 26.07.2021 to 28.07.2021

Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition CI.406.2.1.2
1	Liquid Limit	22.55	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Material Type

: Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	21.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Dasaraj
CIVIL QUALITY CONSULTANTS & ENGINEERS
Havanoor Layout, Bangalore-560 056.
Authorised Signatory



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IS Code:

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Date of Testing

26.07.2021 to 28.07.2021

Material Type

: Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	18.50	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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IS Code: IS 2720(Part 5):1985

Date of Testing 26.07.2021 to 28.07.2021

Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	20.00	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 16.08.2021

TEST REPORT ON PAVING BITUMEN

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
BIS Code	IS 73:2013, IS 1203:1978, IS 1208:1978, IS 1205:1978, IS1448(P-69):1969
Date of Testing	16.08.2021
Type of Mix	Dense Graded Bituminous Macadam , VG 30

The results of the tests conducted on the bitumen sample using for Dense Graded Bituminous Macadam

Sl.No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 100gms, 5sec, 1/10 mm	54	Min 45
2	Softening point, °C	65	Min 47
3	Ductility at 25°C, cm	99	Min 40
4	Flash Point, °C	271	Min 220

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JobNo: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 16.08.2021

TEST RESULTS OF AGGREGATE IMPACT VALUE

Client : Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency : M/s. MSV Construction Company, Bangalore.
Name of work : Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.

BIS Code : IS 2386 Part (4):1963

Type of Mix : Dense Graded Bituminous Macadam

Date of test : 16.08.2021

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W1 g	388	386	
2	Weight of aggregate passing 2.36 mm sieve after the test = W2 g	83	81	
3	Weight of aggregate retained 2.36 mm sieve after the test = W3 g	305	305	
5	Aggregate Impact value = percent fines	21.39	20.98	21.19
	100* (W2/W1) percent			

Comments:

→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27%
(Table 500-8 of MORTH specification)

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BIS Code : IS 2386 Part (4):1963
Type of Mix : Dense Graded Bituminous Macadam
Date of test : 16.08.2021

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W1 g	383	381	
2	Weight of aggregate passing 2.36 mm sieve after the test = W2 g	86	84	
3	Weight of aggregate retained 2.36 mm sieve after the test = W3 g	297	297	
5	Aggregate Impact value = percent fines	22.45	22.05	22.25
	100* (W2/W1) percent			

Comments:

→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27%
(Table 500-8 of MORTH specification)

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BIS Code : IS 2386 Part (4):1963

Type of Mix : Dense Graded Bituminous Macadam

Date of test : 16.08.2021

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W ₁ g	382	384	
2	Weight of aggregate passing 2.36 mm sieve after the test = W ₂ g	87	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W ₃ g	295	299	
5	Aggregate Impact value = percent fines	22.77	22.14	22.46
	100* (W ₂ /W ₁) percent			

Comments:

→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27%
(Table 500-8 of MORTH specification)

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Date 16.08.2021

TEST RESULTS OF AGGREGATE SHAPE TEST (Flakiness & Elongation)

Client : Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency : M/s. MSV Construction Company, Bangalore.
Name of work : Improvement to CC road and drains at Defense Colony, Havanoor Layout,
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CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward
no 14 (2 Works), BBMP, Bangalore.
BIS Code : IS 2386 Part (1):1963
Date of Test 16.08.2021
Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	10.10	11.70	21.80	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	11.90	10.50	22.40	
3	9.90	12.30	22.20	

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TEST RESULTS OF AGGREGATE SHAPE TEST (Flakiness & Elongation)

Client : Executive Engineer, Dasarahalli Division, BBMP, Bangalore.

Agency : M/s. MSV Construction Company, Bangalore.

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BIS Code : IS 2386 Part (1):1963

Date of Test : 16.08.2021

Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	12.10	11.60	23.70	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	10.60	11.70	22.30	
3	11.50	10.90	22.40	

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Client : Executive Engineer, Dasarahalli Division, BBMP, Bangalore.

Agency : M/s. MSV Construction Company, Bangalore.

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BIS Code : IS 2386 Part (1):1963

Date of Test 16.08.2021

Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	11.90	10.50	22.40	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	10.90	10.70	21.60	
3	11.70	10.50	22.20	

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Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 18.08.2021

Specific Gravity And Water Absorption Test

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
IS code:	IS 2386 (Part 3):1963(RA 2011)
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	16.08.2021 to 18.08.2021

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2021	2023	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1265	1266	1268	
4	Weight of saturated surface dry aggregate in air	W_3 g	2015	2017	2018	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_s)$ g	750	751	750	
6	Weight of oven dried aggregate	W_4 g	2003	2005	2007	
7	Specific Gravity	$W_4 / (W_3 - W_s)$	2.671	2.670	2.676	2.672
8	Apparent Specific gravity	$W_4 / (W_4 - W_s)$	2.714	2.713	2.716	2.714
9	Water Absorption	$((W_3 - W_4) * 100) / W_4$	0.60%	0.60%	0.55%	0.58%

Comments:

→ Maximum allowable Aggregate Water absorption value for Dense Graded Bituminous Macadam is 2.0%(AS per MORTH specification 5th edition table no 500..8)

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Laboratory as per ISO/IEC - 17025:2017

Testing of Construction Material - Mechanical, Soil,
Bitumen, Non Destructive Testing Services, Project
Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 16.08.2021

Aggregate Gradation Test

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963(RA 2011)
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	16.08.2021

Total Weight of Sample: 10000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.50	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.50	562	5.6	5.62	94.38	90 - 100	
19.00	1234	12.3	17.96	82.04	71 - 95	
13.20	1592	15.9	33.88	66.12	56 - 80	
4.75	2204	22.0	55.92	44.08	38 - 54	
2.36	1735	17.4	73.27	26.73	28 - 42	
0.300	1309	13.1	86.36	13.64	7 - 21	
0.075	1054	10.5	96.90	3.10	2 - 8	

Total Weight of Sample: 10000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.5	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.5	565	5.7	5.65	94.35	90 - 100	
19	1429	14.3	19.94	80.06	71 - 95	
13.2	1135	11.4	31.29	68.71	56 - 80	
4.75	2274	22.7	54.03	45.97	38 - 54	
2.360	1308	13.1	67.11	32.89	28 - 42	
0.300	1597	16.0	83.08	16.92	7 - 21	
0.075	1167	11.7	94.75	5.25	2 - 8	

Note:

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For CIVIL QUALITY CONSULTANTS & ENGINEERS

Signature

Authorised Signatory

Corporate Off.: No. 133, Bhuvaneshwarinagar, Doddabasti Main Road, Bangalore-560 056.
Contact: 8553518550, 080-23240644 Email: civilqualityconsultants@gmail.com



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Testing of Construction Material - Mechanical, Soil,
Bitumen, Non Destructive Testing Services, Project
Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 16.08.2021

Aggregate Gradation Test

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963(RA 2011)
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	16.08.2021

Total Weight of Sample: 10000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.50	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.50	669	6.7	6.69	93.31	90 - 100	
19.00	1158	11.6	18.27	81.73	71 - 95	
13.20	1623	16.2	34.50	65.50	56 - 80	
4.75	2147	21.5	55.97	44.03	38 - 54	
2.36	1782	17.8	73.79	26.21	28 - 42	
0.300	1239	12.4	86.18	13.82	7 - 21	
0.075	864	8.6	94.82	5.18	2 - 8	

Total Weight of Sample: 10000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.5	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.5	657	6.6	6.57	93.43	90 - 100	
19	1493	14.9	21.50	78.50	71 - 95	
13.2	1127	11.3	32.77	67.23	56 - 80	
4.75	2058	20.6	53.35	46.65	38 - 54	
2.360	1306	13.1	66.41	33.59	28 - 42	
0.300	1542	15.4	81.83	18.17	7 - 21	
0.075	1144	11.4	93.27	6.73	2 - 8	

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Testing of Construction Material - Mechanical, Soil,
Bitumen, Non Destructive Testing Services, Project
Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 20.08.2021

TEST REPORT ON STABILITY OF MIX

Client	: : Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: : M/s. MSV Construction Company, Bangalore.
Name of the Work	: : Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Type of Mix	: Dense Graded Bituminous Macadam
Date of Testing	: 20.08.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.56	10.61	9 Kn (min)
2	Marshal flow, mm	2.23	3.48	2 - 4
3	Percent air voids in Mineral Aggregate	13.02	14.11	13 - 15
4	Voids in Compacted Mix	3.29	5.46	3 - 6
5	Percent Voids filled with Bitumen	66.52	73.27	65 - 75
6	Density, g/cc	2.26	2.27	--

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Bitumen, Non Destructive Testing Services, Project
Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 18.10.2021

TEST REPORT ON STABILITY OF MIX

Client	:	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	:	: M/s. MSV Construction Company, Bangalore.
Name of the Work	:	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Type of Mix	:	: Dense Graded Bituminous Macadam
Date of Testing	:	: 18.10.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.22	10.65	9 Kn (min)
2	Marshal flow, mm	3.66	2.61	2 - 4
3	Percent air voids in Mineral Aggregate	14.46	13.90	13 - 15
4	Voids in Compacted Mix	3.43	4.23	3 - 6
5	Percent Voids filled with Bitumen	70.21	71.67	65 - 75
6	Density, g/cc	2.26	2.25	--

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Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 08.11.2021

TEST REPORT ON STABILITY OF MIX

Client	:	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	:	: M/s. MSV Construction Company, Bangalore.
Name of the Work	:	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Type of Mix	:	: Dense Graded Bituminous Macadam
Date of Testing	:	: 08.11.2021

The results of the tests conducted on the Dense Graded Bituminous Macadam mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.11	10.52	9 Kn (min)
2	Marshal flow, mm	2.06	3.49	2 - 4
3	Percent air voids in Mineral Aggregate	13.05	14.91	13 - 15
4	Voids in Compacted Mix	3.63	5.45	3 - 6
5	Percent Voids filled with Bitumen	70.18	72.37	65 - 75
6	Density, g/cc	2.25	2.26	--

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Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 20.08.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX AASHTO T 164 & AASHTO T 30

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Date of Testing	20.08.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	476.8	477.2
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	23.20	22.80
7. Bitumen content in %	4.64	4.56
8. Average	4.60	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	31.5	31.5	6.6	93.4	90 - 100
19	80.8	112.3	23.6	76.4	71 - 95
13.2	62.9	175.2	36.7	63.3	56 - 80
4.75	77.4	252.6	53.0	47.0	38 - 54
2.360	59.5	312.1	65.5	34.5	28 - 42
0.300	83.6	395.7	83.0	17.0	7 - 21
0.075	46.4	442.1	92.7	7.3	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	32.9	32.9	6.9	93.1	90 - 100
19	82.5	115.4	24.2	75.8	71 - 95
13.2	65.6	181	37.9	62.1	56 - 80
4.75	74.9	255.9	53.6	46.4	38 - 54
2.360	63.2	319.1	66.9	33.1	28 - 42
0.300	85.4	404.5	84.8	15.2	7 - 21
0.075	48.5	453	94.9	5.1	2 - 8

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Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 18.10.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX AASHTO T 164 & AASHTO T 30

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Date of Testing	18.10.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.4	476.9
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	22.60	23.10
7. Bitumen content in %	4.52	4.62
8. Average	4.57	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	34.5	34.5	7.2	92.8	90 - 100
19	55.7	90.2	18.9	81.1	71 - 95
13.2	61.8	152	31.8	68.2	56 - 80
4.75	72.9	224.9	47.1	52.9	38 - 54
2.360	62.5	287.4	60.2	39.8	28 - 42
0.300	83.3	370.7	77.6	22.4	7 - 21
0.075	82.4	453.1	94.9	5.1	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	32.2	32.2	6.8	93.2	90 - 100
19	61.5	93.7	19.6	80.4	71 - 95
13.2	59.8	153.5	32.2	67.8	56 - 80
4.75	70.2	223.7	46.9	53.1	38 - 54
2.360	73.3	297	62.3	37.7	28 - 42
0.300	82.1	379.1	79.5	20.5	7 - 21
0.075	59.9	439	92.1	7.9	2 - 8

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Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 08.11.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE GRADED BITUMINOUS MACADAM MIX AASHTO T 164 & AASHTO T 30

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Date of Testing	08.11.2021

BITUMEN CONTENT DETERMINATION

Description	Test 1	Test 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	477.2	476.9
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g (corrected)	22.80	23.10
7. Bitumen content in %	4.56	4.62
8. Average	4.59	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Test 1				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	28.5	28.5	6.0	94.0	90 - 100
19	83.6	112.1	23.5	76.5	71 - 95
13.2	75.1	187.2	39.2	60.8	56 - 80
4.75	80.9	268.1	56.2	43.8	38 - 54
2.360	54.6	322.7	67.6	32.4	28 - 42
0.300	82.2	404.9	84.8	15.2	7 - 21
0.075	34.8	439.7	92.1	7.9	2 - 8

SIEVE SIZE	Test 2				Requirement as per MORTH table 500.10
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
37.5	0	0	0	100	100
26.5	29.7	29.7	6.2	93.8	90 - 100
19	78.8	108.5	22.8	77.2	71 - 95
13.2	53.2	161.7	33.9	66.1	56 - 80
4.75	84.5	246.2	51.6	48.4	38 - 54
2.360	60.6	306.8	64.3	35.7	28 - 42
0.300	88.9	395.7	83.0	17.0	7 - 21
0.075	51.7	447.4	93.8	6.2	2 - 8

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Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 30.08.2021

TEST REPORT

Client	:	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	:	: M/s. MSV Construction Company, Bangalore.
Name of the work	:	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
IS Code	:	: IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source	:	: VG 30
Date of testing	:	: 30.08.2021

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	48	Min 45
2	Softening point, °C	57	Min. 47
3	Ductility at 27°C, cm	> 100	Min. 40
4	Flash Point, °C	255	Min. 220

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Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 30.08.2021

Aggregate Impact Value

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
BIS Code	IS 2386(Part 4):1963
Type of Mix	Bituminous Concrete
Date of Testing	30.08.2021

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	384	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	81	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines	21.20	21.61	21.41
	$100 * (W_2/W_1)$ percent			

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

Note:

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For CIVIL QUALITY CONSULTANTS & ENGINEERS

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Corporate Off.: No. 133, Bhuvaneshwarinagar, Doddabasti Main Road, Bangalore-560 056.
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Testing of Construction Material - Mechanical, Soil,
Bitumen, Non Destructive Testing Services, Project
Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 30.08.2021

Aggregate Impact Value

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
BIS Code	IS 2386(Part 4):1963
Type of Mix	Bituminous Concrete
Date of Testing	30.08.2021

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	380	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	80	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	302	298	
4	Aggregate Impact value = percent fines	20.94	21.58	21.26
	$100 \times (W_2/W_1)$ percent			

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 30.08.2021

Aggregate Impact Value

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
BIS Code	IS 2386(Part 4):1963
Type of Mix	Bituminous Concrete
Date of Testing	30.08.2021

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	388	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	87	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	299	303	
4	Aggregate Impact value = percent fines	22.54	21.91	22.22
	$100 * (W_2/W_1)$ percent			

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

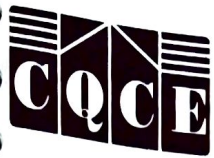
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Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date : 30.08.2021

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: Executive Engineer , Dasarahalli Division, BBMP, Bangalore
Agency	: M/s. MSV Construction Company , Bangalore.
Name of Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	30.08.2021

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	10.4	10.7	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	11.8	11.70	
	Combined Flakiness & Elongation index	22.20	22.40	

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Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date : 30.08.2021

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	30.08.2021

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	10.9	11.4	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	11.2	10.5	
	Combined Flakiness & Elongation index	22.10	21.90	

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Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date : 30.08.2021

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	30.08.2021

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	11.9	10.6	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	10.1	11.3	
	Combined Flakiness & Elongation index	22.00	21.90	

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Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date : 01.09.2021

Specific Gravity And Water Absorption Test

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	30.08.2021 to 01.09.2021

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2022	2019	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1265	1267	1264	
4	Weight of saturated surface dry aggregate in air	W_3 g	2011	2013	2015	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_s)$ g	746	746	751	
6	Weight of oven dried aggregate	W_4 g	2003	2005	2006	
7	Specific Gravity	$W_4 / (W_3 - W_s)$	2.685	2.688	2.671	2.681
8	Apparent Specific gravity	$W_4 / (W_4 - W_s)$	2.714	2.717	2.704	2.711
9	Water Absorption	$((W_3 - W_4) * 100) / W_4$	0.40%	0.40%	0.45%	0.42%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0% (MORTH table 500.16)

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Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date : 30.08.2021

Aggregate Gradation Test

IS : 2386 Part I

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963
Type of Mix	Bituminous Concrete
Date of Testing	30.08.2021

Total Weight of Sample: 5000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	387	7.74	7.74	92.26	90 - 100	
9.5	422	8.44	16.18	83.82	70 - 88	
4.75	685	13.70	29.88	70.12	53 - 71	
2.36	649	12.98	42.86	57.14	42 - 58	
1.18	503	10.06	52.92	47.08	34 - 48	
0.600	517	10.34	63.26	36.74	26 - 38	
0.300	468	9.36	72.62	27.38	18 - 28	
0.150	424	8.48	81.10	18.90	12 - 20	
0.075	498	9.96	91.06	8.94	4 - 10	

Total Weight of Sample: 5000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	414	8.28	8.28	91.72	90 - 100	
9.5	467	9.34	17.62	82.38	70 - 88	
4.75	682	13.64	31.26	68.74	53 - 71	
2.36	673	13.46	44.72	55.28	42 - 58	
1.18	609	12.18	56.90	43.10	34 - 48	
0.600	525	10.50	67.40	32.60	26 - 38	
0.300	432	8.64	76.04	23.96	18 - 28	
0.150	389	7.78	83.82	16.18	12 - 20	
0.075	506	10.12	93.94	6.06	4 - 10	

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Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date : 30.08.2021

Aggregate Gradation Test IS : 2386 Part I

Client	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: M/s. MSV Construction Company, Bangalore.
Name of the Work	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963
Type of Mix	Bituminous Concrete
Date of Testing	30.08.2021

Total Weight of Sample: 5000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	411	8.22	8.22	91.78	90 - 100	
9.5	427	8.54	16.76	83.24	70 - 88	
4.75	695	13.90	30.66	69.34	53 - 71	
2.36	654	13.08	43.74	56.26	42 - 58	
1.18	512	10.24	53.98	46.02	34 - 48	
0.600	526	10.52	64.50	35.50	26 - 38	
0.300	478	9.56	74.06	25.94	18 - 28	
0.150	419	8.38	82.44	17.56	12 - 20	
0.075	488	9.76	92.20	7.80	4 - 10	

Total Weight of Sample: 5000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	438	8.76	8.76	91.24	90 - 100	
9.5	479	9.58	18.34	81.66	70 - 88	
4.75	674	13.48	31.82	68.18	53 - 71	
2.36	649	12.98	44.80	55.20	42 - 58	
1.18	613	12.26	57.06	42.94	34 - 48	
0.600	538	10.76	67.82	32.18	26 - 38	
0.300	449	8.98	76.80	23.20	18 - 28	
0.150	346	6.92	83.72	16.28	12 - 20	
0.075	487	9.74	93.46	6.54	4 - 10	

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Management Consultants, Third Party Quality Assurance, DPR.

Date: 22.10.2021

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

TEST REPORT ON STABILITY OF MIX

Client	:	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	:	: M/s. MSV Construction Company, Bangalore.
Name of the Work	:	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Type of Mix	:	: Bituminous Concrete
Date of Testing	:	: 22.10.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.29	10.65	9 Kn (min)
2	Marshal flow, mm	2.74	3.39	2 - 4
3	Percent air voids in Mineral Aggregate	13.11	14.57	13 - 15
4	Voids in Compacted Mix	3.08	5.16	3 - 6
5	Percent Voids filled with Bitumen	66.17	73.31	65 - 75
6	Density, g/cc	2.26	2.27	--

Note:

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Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date: 17.11.2021

TEST REPORT ON STABILITY OF MIX

Client	: : Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
Agency	: : M/s. MSV Construction Company, Bangalore.
Name of the Work	: : Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
Type of Mix	: Bituminous Concrete
Date of Testing	: 17.11.2021

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

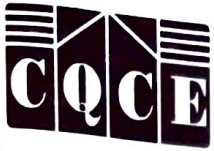
Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	9.56	10.82	9 Kn (min)
2	Marshal flow, mm	2.45	3.17	2 - 4
3	Percent air voids in Mineral Aggregate	13.93	14.57	13 - 15
4	Voids in Compacted Mix	3.26	5.63	3 - 6
5	Percent Voids filled with Bitumen	67.12	73.39	65 - 75
6	Density, g/cc	2.27	2.25	--

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Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date : 06.09.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE AASHTO T 164 & AASHTO T 30

CLIENT	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
AGENCY	: M/s. MSV Construction Company, Bangalore.
NAME OF THE WORK	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
DATE OF TESTING	06.09.2021

BITUMEN CONTENT DETERMINATION			
Description	Sample 1	Sample 2	
1. Weight of Mixture before Test, g	500	500	
2. Weight of Mixture after Test, g	469.5	469.8	
3. Weight of Asphalt and Mineral matter Extracted, g	30.5	30.2	
4. Weight of Mineral Matter, g	-	-	
5. Weight of Ash, g	-	-	
6. Weight of Bitumen Extracted, g. (corrected)	30.5	30.2	
7. Bitumen content in %	6.10	6.04	
8. Average	6.07		

GRADATION AFTER EXTRACTION					
SIEVE SIZE	Test 1				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	13.6	13.6	2.9	97.1	90 - 100
9.5	56.4	70	14.9	85.1	70 - 88
4.75	93.5	163.5	34.8	65.2	53 - 71
2.36	44.7	208.2	44.3	55.7	42 - 58
1.18	42.8	251	53.5	46.5	34 - 48
0.600	56.5	307.5	65.5	34.5	26 - 38
0.300	52.1	359.6	76.6	23.4	18 - 28
0.150	34.7	394.3	84.0	16.0	12 - 20
0.075	47.9	442.2	94.2	5.8	4 - 10
SIEVE SIZE	Test 2				Requirement as per MORTH table 500.17
mm	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.5	14.5	3.1	96.9	90 - 100
9.5	60.9	75.4	16.0	84.0	70 - 88
4.75	93.8	169.2	36.0	64.0	53 - 71
2.36	50.1	219.3	46.7	53.3	42 - 58
1.18	43.6	262.9	56.0	44.0	34 - 48
0.600	50.8	313.7	66.8	33.2	26 - 38
0.300	29.6	343.3	73.1	26.9	18 - 28
0.150	39.5	382.8	81.5	18.5	12 - 20
0.075	44.7	427.5	91.0	9.0	4 - 10

Note:
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FOR CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorized Signatory



CIVIL QUALITY CONSULTANTS & ENGINEERS

ISO 9001:2015 Certified & NABL Accredited
Laboratory as per ISO/IEC - 17025-2017

Testing of Construction Material - Mechanical, Soil,
Bitumen, Non Destructive Testing Services, Project
Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date : 22.10.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
AGENCY	: M/s. MSV Construction Company, Bangalore.
NAME OF THE WORK	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
DATE OF TESTING	22.10.2021

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	469.6	469.9
3. Weight of Asphalt and Mineral matter Extracted, g	30.4	30.1
4. Weight of Mineral Matter, g	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	30.4	30.1
7. Bitumen content in %	6.08	6.02
8. Average	6.05	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	15.9	15.9	3.4	96.6	90 - 100
9.5	60.9	76.8	16.4	83.6	70 - 88
4.75	82.5	159.3	33.9	66.1	53 - 71
2.36	53.7	213	45.4	54.6	42 - 58
1.18	48.6	261.6	55.7	44.3	34 - 48
0.600	57.2	318.8	67.9	32.1	26 - 38
0.300	50.1	368.9	78.6	21.4	18 - 28
0.150	31.9	400.8	85.3	14.7	12 - 20
0.075	46.5	447.3	95.3	4.7	4 - 10

SIEVE SIZE mm	Test 2				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	12.8	12.8	2.7	97.3	90 - 100
9.5	64.5	77.3	16.5	83.5	70 - 88
4.75	90.3	167.6	35.7	64.3	53 - 71
2.36	48.7	216.3	46.0	54.0	42 - 58
1.18	51.3	267.6	56.9	43.1	34 - 48
0.600	53.5	321.1	68.3	31.7	26 - 38
0.300	46.4	367.5	78.2	21.8	18 - 28
0.150	31.8	399.3	85.0	15.0	12 - 20
0.075	38.5	437.8	93.2	6.8	4 - 10

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For CIVIL QUALITY CONSULTANTS & ENGINEERS
Authorized Signatory

Corporate Off.: No. 133, Bhuvaneshwarinagar, Doddabasti Main Road, Bangalore-560 056.

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CIVIL QUALITY CONSULTANTS & ENGINEERS

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Testing of Construction Material - Mechanical, Soil,
Bitumen, Non Destructive Testing Services, Project
Management Consultants, Third Party Quality Assurance, DPR.

Job No.: CQCE/BBMP/MSV/W.No.14/2021-22

Date : 17.11.2021

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE AASHTO T 164 & AASHTO T 30

CLIENT	: Executive Engineer, Dasarahalli Division, BBMP, Bangalore.
AGENCY	: M/s. MSV Construction Company, Bangalore.
NAME OF THE WORK	: Improvement to CC road and drains at Defense Colony, Havanoor Layout, Munikondappa Layout in Bagalagunte and Improvements to roads and drains at 16th A cross 19th Cross and other cross roads at Bagalagunte main road, improvements to CC roads surrounding of Magnam school Bhuvaneshwari nagara at Bagalagunte ward no 14 (2 Works), BBMP, Bangalore.
DATE OF TESTING	17.11.2021

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	469.4	469.8
3. Weight of Asphalt and Mineral matter Extracted, g	30.6	30.2
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	30.6	30.2
7. Bitumen content in %	6.12	6.04
8. Average	6.08	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	13.8	13.8	2.9	97.1	90 - 100
9.5	64.5	78.3	16.7	83.3	70 - 88
4.75	92.7	171	36.4	63.6	53 - 71
2.36	43.5	214.5	45.7	54.3	42 - 58
1.18	41.6	256.1	54.6	45.4	34 - 48
0.600	56.9	313	66.7	33.3	26 - 38
0.300	52.7	365.7	77.9	22.1	18 - 28
0.150	23.8	389.5	83.0	17.0	12 - 20
0.075	50.7	440.2	93.8	6.2	4 - 10

SIEVE SIZE mm	Test 2				Requirement as per MORTH table 500.17
	Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	14.5	14.5	3.1	96.9	90 - 100
9.5	64.9	79.4	16.9	83.1	70 - 88
4.75	91.7	171.1	36.4	63.6	53 - 71
2.36	48.5	219.6	46.7	53.3	42 - 58
1.18	55.6	275.2	58.6	41.4	34 - 48
0.600	53.7	328.9	70.0	30.0	26 - 38
0.300	42.5	371.4	79.1	20.9	18 - 28
0.150	31.6	403	85.8	14.2	12 - 20
0.075	37.2	440.2	93.7	6.3	4 - 10

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For SEAL QUALITY CONSULTANTS & ENGINEERS
20206
Authorised Signature

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